

Original Article

## A Retrospective Analysis of Pain Localizations in Emergency Department

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### Abstract

**Background:** Pain is a complex and difficult condition that is the most commonly reported symptom in the emergency department worldwide. To provide more effective pain management, it is very important to know the localization of the patients' pain visiting the emergency department and to define the health problems leading to the pain.

**Aims:** To determine the localization of pain in the emergency department.

**Methodology:** This study was examined the hospital records of 24994 patients who are admitted to a university hospital emergency department with pain between January 2018-January 2019 in Istanbul/Turkey, retrospectively.

**Results:** 46.8% (11700) of patients were male; 53.2% (13294) of patients were female. 10.8% (2704) of patients were 18 years old and under, and 89.2% (22290) of patients were over 18 years old. The most common localization of pain to admit to the emergency department was musculoskeletal pain with 31% due to joint-muscle-bone pain, trauma, rheumatoid arthritis, and myalgia.

**Conclusion:** Pain frequently occupies the healthcare professionals in the emergency departments. In this study, it is understood the importance of increasing individual precautions and teaching symptomatic treatments to individuals in traumatic or non-traumatic musculoskeletal damage and diseases. In order to improve pain management, effective protocols are needed for the prevention and management of pain, which is a frequent cause of admission to emergency departments, especially musculoskeletal pain.

**Key Words:** Emergency Hospital Service; Pain; Pain Assessment

### Introduction

Pain is a complex and difficult to define a condition that is affected by many factors such as age, gender, education, environment, culture and experiences (Yilmaz & Kucuk Alemdar, 2019). It is defined by the International Association for Study of Pain as "an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage" (International Association for Study of Pain, 2019). It was emphasized by the American Pain Society, the Joint Commission International and some other scientific and professional organizations that pain was the fifth

vital sign 22 years ago (McCaffery & Pasero, 1997).

Pain, a highly subjective phenomenon, is the most commonly reported symptom in the emergency department (ED) worldwide and it covers 75-80% of all visits (Gleason, Escue & Hogan, 2018; Cisewski & Motov, 2019). In the USA, more than 100 million patients visit ED each year with pain complaints (CDC National Hospital Ambulatory Medical Care Survey, 2015). The number of patients admitted to the ED in Turkey is about 36 million in 2013 (Oner Simsek, 2018). It is known that many adult patients present to the emergency department with complaints of pain such as chest pain

(Cadet, 2019), abdominal pain (Donnelly et al., 2019), headache (Tabatabai & Swadron, 2016), musculoskeletal pain (Duffield et al., 2017), renal colic pain (Motov et al., 2018), psychological pain (Meerwijk & Weiss, 2018). Early and effective treatment of acute pain is critical in the short and long term (Macintyre & Schug, 2014). Waiting in the emergency department with pain is emotionally and physically harmful (World Health Organisation Guidelines, 2019). Patients want to recognition, assessment and management of pain.

To provide more effective health services and to increase the quality of patient care, it is very important to know the localization of the patients' pain visiting the emergency department and to define the health problems leading to the pain. The aim of this study was determined the localization of pain according to cause in the emergency department who are admitted to a university hospital emergency department with pain.

## Method

**Research Design and Sample:** In this study, patients who applied to the emergency department of a university hospital in Istanbul/Turkey between January 2018, and January 2019 were examined retrospectively. Information about age, gender, diagnosis and localizations of pain were collected by examining the records obtained from the Patient Information Management System program of the hospital. In the collection of the data, initial admission of each patient to the emergency department were evaluated. In these data, the demographic characteristics of the patients diagnosed with pain with the ICD-10 code (R52.9) and the cause and localization of the pain were determined in the information about the patients admitted to the emergency department. In determining the location of the pain, the relationship between the location of the pain and the cause of the pain was evaluated. For example, when the data of patients diagnosed with headaches were examined in the emergency department, pain codes of patients were evaluated like R52.9 Pain, unspecified, G44 Headache, G43 Migraine; or R52.9 Pain, unspecified, G44 Headache, I10 Essential Hypertension. Then localization of pain was decided for headache caused by migraine is classified as localization in the neurological system, while headache caused by hypertension is classified as cardiovascular localization.

Localizations according to cause of pain are below:

*-Pain localized in the musculoskeletal system due to joint, muscle, bone pain, trauma, rheumatoid arthritis, and myalgia,*

*-Pain localized in the digestive system due to an ulcer, gastritis, nausea, vomiting, gastroenteritis, cholelithiasis, pancreatitis, and constipation,*

*-Pain localized in the cardiovascular system due to venous insufficiency, hypertension, and myocardial infarction,*

*-Pain localized in the genitourinary system due to pelvic inflammatory disease, menstruation pain, labor, cystitis, renal colic, and renal failure*

*-Pain localized in nervous system due to cerebrovascular diseases, epilepsy, multiple sclerosis, and migraine,*

*-Pain localized in respiratory system due to chronic obstructive pulmonary disease, asthma, upper and lower respiratory tract infections,*

*-Pain localized in skin tissues due to burns and dermatitis,*

*-Psychological pain due to delirium, dementia, anxiety, depression and substance abuse,*

*-Unspecified pain.*

**Data Analysis:** Retrospective data of the study was collected by examining the computer records of patients with pain. From this data, age, gender, medical diagnosis and consultations were listed. Analyses of the data collected from the computer recording system were performed using MS EXCEL. Numbers and percentages were calculated.

**Ethical Approval:** This study received necessary ethics approval from the Hospital Ethics Committee (2019/0058) and the related institution for conducting the study.

## Results

24994 patients have admitted to the emergency department for pain between the dates indicated. 46.8% (11700) of patients were male and 53.2% (13294) were female. 10.8% (2704) of patients were 18 years old and under, and 89.2% (22290) were over 18 years old. 6.7% (1680) of these patients were admitted to the emergency department from the red area, 48.4% (12081) from the yellow area and 44.9% (11233) from the green area.

The systems in which pain is localized according to the cause are shown in Figure 1. 31.0% (7748) of the patients' pain was localized in the

musculoskeletal system, 18.5% (4624) had localized pain in the digestive system, 14.8% (3699) localized pain in the cardiovascular system, 14.5% (3624) had unspecified pain, 8.3% (2074) of the genitourinary system localized pain, 6.3% (1575) of the nervous system localized pain, 4.8% (1200) of the localized pain in the respiratory system, 1.2% (300) of skin diseases, 0.6% (150) of psychiatry. After examining the localization of pain in the patients admitted to the

emergency department, the patient was consulted to various medical branches to determine the cause of the patient's pain.

The consultations of the patients are shown in Figure 2. When the medical branches that the patients were consulted were examined, it was found that the highest rate was orthopedics and the lowest rate was physiotherapy and forensic medicine.

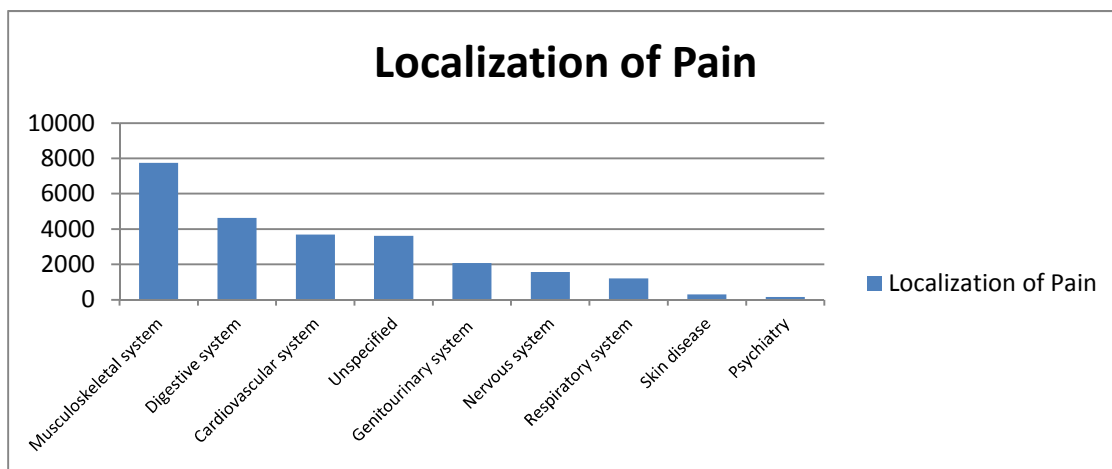


Figure 1. Systems where the pain is localized according to cause (N=24994)

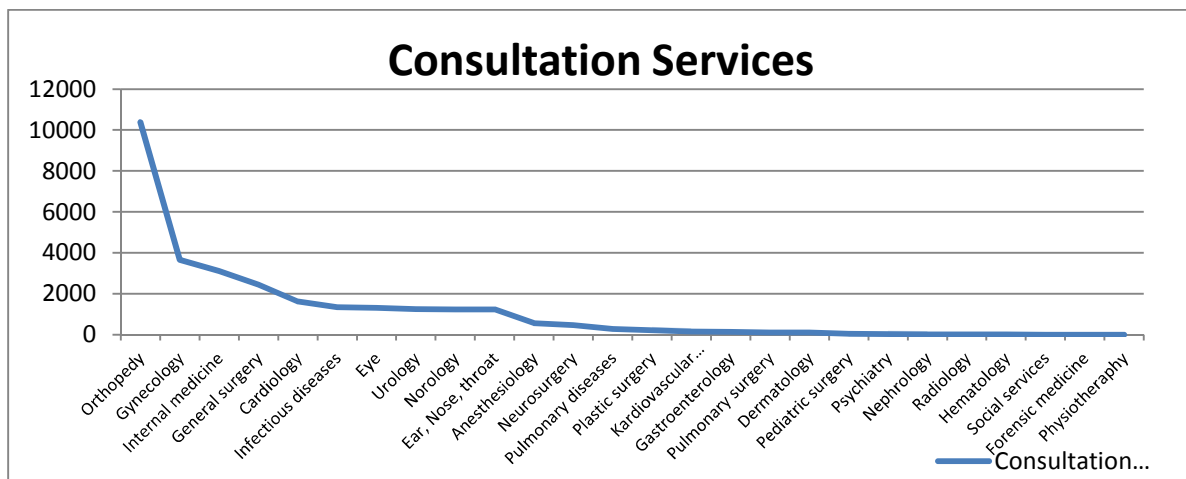


Figure 2. Consultations of patients (n folder)

## Discussion

In this study, it was determined that the localization according to cause of pain of the patients who admitted to the emergency department were mostly in the musculoskeletal system (31.0%). Non-traumatic and traumatic musculoskeletal system damage and diseases due to trauma such as traffic accidents, falls and injuries are frequently occupied by emergency departments (Awolola, Campbell & Ross, 2015; Ridderikhof et al., 2018; McCarney Derksen, 2019). Yilmaz et al. (2019) reported that the most common causes were trauma related to the musculoskeletal system and Seviner et al. (2013) reported that the most common injuries were extremity injuries with 41% ratio in the emergency department. The musculoskeletal system consists of bones, joints, muscles, ligaments and tendons, and these tissues are damaged by trauma, chronic inflammation, working conditions and malnutrition, causing pain at the patient (Musculoskeletal conditions, 2019). There are many musculoskeletal conditions characterized by pain, including systemic inflammatory conditions such as rheumatoid arthritis and spondyloarthritis; degenerative conditions such as osteoarthritis; fragility conditions such as osteoporosis and fractures; and regional pain syndromes such as back and neck pain and, the widespread pain condition fibromyalgia (Meerwijk & Weiss, 2018). Diseases associated with the musculoskeletal system are one of the important factors affecting the quality of life (Institute for Health Metrics and Evaluation, 2019). Heikkinen et al. (2019) reported a negative relationship between major depression and chronic low back pain, anxiety disorder and cervicolumbar hernia, life satisfaction and osteoporosis, osteoporosis-related bone fractures and quality of life. Therefore, musculoskeletal conditions adversely affect the physical and psychosocial functioning of many people. This may increase the admission to the emergency department.

According to another result of this study, 18.5% of the patients who applied to the emergency department with pain were responsible for digestive system conditions. Bedel and Tomruk (2018) reported that in their studies examining the reasons for admission to the emergency department, 15.7% of patients had abdominal pain. Donnelly et al. (2019) reported that the most common pain in the emergency department was acute abdominal pain. Hooker, Mallow and

Oglesby (2019) reported that 18.7% of the patients admitted to the emergency department because of abdominal pain. When the causes of abdominal pain are examined, aortic aneurysm, appendicitis, peptic ulcer perforation, ileus, peritonitis, colitis, pancreatitis, gastrointestinal system tumors, intestinal obstructions, biliary tract obstructions, gastroenteritis, and other gastrointestinal system infections were known but, except for the symptoms of non-compliant abdominal pain, there are also some types of abdominal pain that cannot reach clear and concise results and often relieve the pain in the emergency room (Kaya, Kuvandik & Karakus, 2018; Donnelly et al., 2019). Therefore, it may not be sufficient to evaluate the physical findings of the patient with abdominal pain, but also to determine and meet the psychosocial needs of the patient.

According to another result of this study, it was determined that 14.8% of the patients who were admitted to the emergency department belong to the cardiovascular system conditions. Bedel and Tomruk (2018) reported that the reason for admission to the emergency department was cardiovascular conditions (20.7%) and chest pain (11.2%). Mozaffarian et al. (2015) reported that 5-10% of adults admitted to the emergency department were due to chest pain, but less than 1% required acute intervention. When the pain localizations associated with cardiovascular conditions are examined, cardiac chest pain complaints are more common (Cadet, 2019). When the cause of cardiac chest pain is examined, it is seen that the most common etiology was acute cardiac events. These include myocardial infarction, hypertension, unstable angina pectoris, aortic aneurysm, and aortic dissection (Cadet, 2019).

According to the other results of this study, 8.3% of the pain of the patients admitted to the emergency department belong to the genitourinary system conditions. Bourke and Silverberg (2019) reported that admissions to the emergency department were less than 1% due to genitourinary pain. When the literature is reviewed, the cause of genitourinary pain requiring admission to the emergency department is pelvic inflammatory disease, urinary tract infections, ectopic pregnancy rupture, labor, vaginitis, menstruation, orchitis, renal colic, renal failure, ovarian cysts, ovarian torsions, abnormal vaginal bleeding, Bartolini cyst (Schmitz &

Tibbles, 2011; Kaya, Kuvandik & Karakus, 2018).

According to another result of this study, 6.3% of the pain of the patients admitted to the emergency department belongs to the nervous system conditions. When pain forms with nervous system localization are examined, headache is usually defined (Gago-Veiga et al., 2017; Royuela et al., 2019). Royuela et al. (2019) reported that 1-4.5% of patients admitted to the emergency department had headache complaints. When the cause of pain localized in the nervous system is examined, acute ischemic stroke, intracerebral hemorrhage, subarachnoid hemorrhage, chronic subdural hematoma, traumatic brain injuries, central nervous system infections, and neurological seizure attacks are seen (Nentwich & Grimmnitz, 2016).

According to another result of this study, it was determined that 4.8% of the pain of the patients admitted to the emergency department belonged to the respiratory system conditions. According to the results of the study conducted in another emergency department, 11.1% of the patients were admitted to the emergency department with respiratory system diseases and 15.7% of these patients presented with dyspnea (Bedel & Tomruk, 2018). Goktekin (2019) found that dyspnea is the most common symptom in patients presenting to the emergency department and that the etiological disease-causing dyspnea is a chronic obstructive pulmonary disease. Sonmez et al. (2019) found that the most common reason for admission to the emergency department was upper respiratory tract infections (24.7%).

According to the results of this study, it was determined that 1.2% of the pain of patients admitted to the emergency department was caused by skin diseases. Martínez García (2017) stated that the rate of admission to the emergency department due to the complaint of skin pain was 5-10%. Although the impact of skin disease on patients' daily lives can often be ignored; severe lesions and acute symptoms can force patients and their families to go to the emergency department (Martínez García, 2017). In addition, patients may present to the emergency department due to pain caused by herpes zoster (Asada, 2019).

According to another result of this study, 14.5% of the patients admitted to the emergency department were unspecified pain. According to another result of this study, it was determined

that 0.6% of the pain of patients admitted to the emergency department was caused by psychiatric diseases. Unspecified pain refers to conditions where the localization and etiology are not established, but the pain is indicated by the patient. When the results of this study were examined, the fact that the patients had an unspecified pain was thought to be related to psychological reasons. Yigit et al. (2019) reported that individuals who presented to the emergency department with palpitation and chest pain had high levels of depression and anxiety, independent of the presence of heart disease. Burrell and Robinson (2019) proposed a biopsychosocial model for the best understanding of pain. Martínez-Calderon et al. (2019) found that individuals with high levels of depression had higher pain sensitivity. Meerwijk and Weiss (2018) reported that there is a relationship between the capacity to cope with psychological pain and suicide.

**Conclusion:** From the data obtained from this study, it was determined that patients were diagnosed with musculoskeletal conditions and unspecified pain, and it was seen that musculoskeletal pain was occupied the health professions of emergency department. In addition, unspecified pain is important in order to evaluate the psychiatric disorders of the patients admitted to the emergency department due to pain and to show that a guide is needed to determine this. In addition to importance and meaning of pain for the patient, health professions also have responsibilities in pain management process. Evaluation and management of pain in the emergency department focus on knowledge, communication, organization and pain flow. In this study, it is understood the importance of increasing individual precautions and teaching symptomatic treatments to individuals in traumatic or non-traumatic musculoskeletal damage and diseases. In order to improve pain management, effective protocols are needed for the prevention and management of pain, which is a frequent cause of admission to emergency departments, especially musculoskeletal pain.

**Limitations:** The limitation of this study is being conducted in a single emergency department of a hospital in Turkey.

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